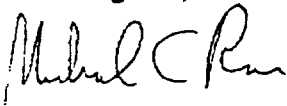


Ms. Beth Somerville
December 21, 1992
Page two

NAB believes strongly that the adoption of ANSI/IEEE C95.1-1992, as currently written, will have a severe negative impact on the broadcast industry. Accordingly, NAB respectfully urges ANSI to rescind its adoption ANSI/IEEE C95.1-1992 until these issues can be resolved.

Best regards,

A handwritten signature in dark ink, appearing to read "Michael C. Rau". The signature is fluid and cursive, with the first name "Michael" being more prominent than the last name "Rau".

Michael C. Rau

cc: Mr. Manuel Peralta, President ANSI
Mr. Gary Kushnier, VP, Standards Technology, ANSI
Mr. Michael Miller, Chairman, Organizational Member Council, ANSI
Ms. Linda A. Gargiulo, IEEE
Barry Umansky, Esq., NAB Legal

SMITH AND POWSTENKO

BROADCASTING AND TELECOMMUNICATIONS CONSULTANTS

WASHINGTON, D. C. 20036

January 25, 1993

NEIL M. SMITH
JEANNE F. SMITH
KEVIN T. FISHER

GEORGE A. POWSTENKO
(1926-1991)

Miss Beth Somerville, Secretary
Board of Standards Review
AMERICAN NATIONAL STANDARDS INSTITUTE
11 West 42nd Street
New York, New York 10036

File GEISO				
JAN 29 '93				
RLH	WPH	GE	GJS	WY
EE	HK	GES	SS	JCS
RSJ	MAW	EM	KL	
JT	MK	JM	LR	

Re: ANSI/IEEE C95.1-1992
Ref: BSR LB 2850 & 2850A

Dear Miss Somerville:

This is in support of the appeal of Dane E. Ericksen, Hammett & Edison, Inc., regarding the above-captioned Notification of Approval of Standard. Specifically, we believe that there is no industry consensus for the adoption of the conducted body current portion of the standard up to a 100 MHz cutoff, and that due process appears not to have been provided.

We take this action with some reluctance. We have not been able to participate in the committee work and hold in the highest regard those who have participated. However, it appears that for whatever reasons, the SC-4 Subcommittee did not afford sufficient opportunity to address this important aspect of the proposed standard.

This firm represents numerous broadcast licensees, including national networks and individual broadcast stations in all 50 states. We participated in early studies of RF exposures from broadcast sources in cooperation with the National Bureau of Standards and have spoken on this subject before the National Association of Broadcasters, the Society of Broadcast Engineers, the Institute of Electrical and Electronics Engineers, the Environmental Protection Agency, and the Engineering Foundation. Thus, while we have an appreciation for the need to adopt standards in this area and a recognition of the difficulties inherent in establishing such standards, we have an obligation to our broadcast clients to oppose a standard that could result in unnecessarily onerous regulation.

Our review of the basis for the proposed standard indicates that there is no scientific justification for extending the conducted body current portion above about 80 MHz. To extend the requirement to 100 MHz in the middle of the FM Broadcast Band means that body currents must be a concern for the station operating on 99.9 MHz but not for the station operating on 100.1 MHz, even though the two stations are regulated similarly in all other respects. Under this proposal, of the fourteen FM stations operating with essentially identical facilities on the Empire State

Miss Beth Somerville
January 25, 1993
Page 2

Building, seven would be subject to the standard, and seven would not. By sheer chance in New York City, ABC would have to comply with this standard, while CBS could ignore it.

It has been said that these are details that need not be considered at this point, but a recognition of the impact of a standard must be part of the adoption process, where, as here, there is no clear basis for a particular cutoff point. It has further been said that the appropriate place to raise these concerns is with the FCC, when it considers adopting the ANSI standard as its own. Having participated in informal committee work with FCC personnel on this subject, I believe I can state with some assurance that, despite having staff persons quite knowledgeable in this field, the FCC will not presume a competence sufficient to modify the findings of ANCI for its own purposes. Apart from arriving at its own policies for compliance by specific licensees or groups of licensees, I do not believe the FCC is prepared to enforce a standard less strict than that adopted by ANSI. Thus, if the FCC should agree that it is unfair to burden half of the FM stations with concerns about induced body currents, rather than eliminate the requirement, it would be most likely simply to extend it to 108 MHz, in order to cover all FM stations.

Based on these concerns, we support this appeal of the subject Approval. It is our hope that the SC-4 Subcommittee can promptly address these questions satisfactorily, so that a revised Standard can be before the Board quickly.

Respectfully submitted,



Neil M. Smith

NMS/pas

cc: Mr. Dane E. Erickson
Dr. Om P. Gandi
Mr. Jules Cohen
Mr. Richard A. Tell
Dr. Robert F. Cleveland, Jr.
Mr. Ralph A. Justus

Greater Media, Inc.

PO Box 1059, Two Kennedy Boulevard
East Brunswick NJ 08816, 908-247-6161

Millard K. Smith, Jr.
Vice President
Radio Engineering

January 12, 1993

Ms. Beth Somerville
Board of Standards Review
American National Standards Institute
11 West 42nd Street
New York, New York 10036

Re: ANSI/IEEE C95.1-1992

Dear Ms. Somerville:

Greater Media, Inc. and its various subsidiaries are the licensees of seven FM and seven AM radio stations located in major markets throughout the United States. I am writing to voice this company's support of Hammett and Edison's (via Mr. Dane Ericksen) appeal of the above noted standard.

It is the opinion of the writer that the data presented in the paper entitled "RF Currents Induced In An Anatomically-Based Model of a Human for Plane-Wave Exposures (20 - 100 mHz)" by Jim-Yuan Chen and Om P. Gandhi, on which much of the standard is apparently based, does not support the use of a 100 mHz "break point" for induced current measurements. Indeed, the data presented would seem to strongly indicate that a break point of approximately 60 mHz would be much more appropriate and consistent with the experimental findings.

ANSI must understand that an arbitrarily chosen 100 mHz break point will potentially have tremendous negative impact on the U.S. broadcasting industry and in particular the 5000+ FM stations most affected by the induced current provisions of the proposed standards. The use of an arbitrary break point in the very center of the FM broadcast band will result in nightmarish compliance concerns for many broadcasters, particularly at multiple user sites.

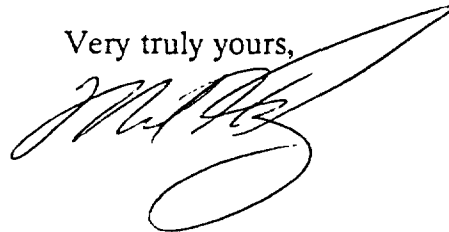
Like many other broadcasters, Greater Media has only recently become aware of this provision of the new C95.1 standard. Informal discussions with our colleagues indicate that they, too, are greatly concerned with the implications of the 100 mHz break point. We would anticipate that you will be hearing from many of them in the near future.

File GEISO				
JAN 18 '93				
RLH	WPH	DEE	GJS	NH
EE	HK	GES	SS	JCS
RSJ	MAW	EM	KL	
JT	MK	JM	LR	

Ms. Beth Somerville
Page Two
January 12, 1993

We would strongly urge A.N.S.I. to give serious extremely consideration to Hammett and Edison's appeal and give absolute priority to modifying the standard and specifying a break point that is in keeping with the data presented and with the very real and severe burden that an arbitrary 100 mHz cut off point would place on the U.S. broadcasting industry.

Very truly yours,

A handwritten signature in black ink, appearing to be "M. H. S.", written in a cursive style with a large loop at the end.

MKS:hc

cc: Dane Ericksen, Hammett and Edison



EXHIBIT 18G

WESTINGHOUSE BROADCASTING COMPANY, INC.
INDEPENDENCE MALL EAST, PHILADELPHIA, PA 19106 (215) 238-4893

E.GLYNN WALDEN
Director of Engineering
Eastern Region

December 22, 1992

Ms. Beth Somerville
Secretary, Board of Standards Review
American National Standards Institute
11 West 42nd Street
New York, NY 10036

Re: Appeal to ANSI's approval of ANSI/IEEE
C95.1-1992

Dear Ms Somerville:

Group W, Westinghouse Broadcasting, is the licensee of eight FM radio stations, nine AM radio stations and five television stations. Westinghouse Broadcasting has only recently learned of the Board of Standards Review approval of ANSI/IEEE C95.1-1992 and wishes to appeal this action.

After reviewing the letters from Dane Ericksen, Hammett & Edison, of 9/5/90, 2/20/92, 4/17/92, 8/31/92, 12/10/92 and the responses from the IEEE and various committee members it is evident that Mr. Ericksen's concerns in the following areas have not been addressed.

SELECTION OF 100 MHZ CUTOFF:

In Mr. Ericksen's various correspondences he points out the lack of scientific justification for the 100 MHz breakpoint. In Dr. Gandhi's response to Mr. Ericksen, of 7/23/92 he fails to justify the choice of 100 MHz as a legitimate breakpoint. In the cited study, "*RF CURRENTS INDUCED IN AN ANATOMICALLY-BASED MODEL OF A HUMAN FOR PLANE-WAVE EXPOSURES (20-100 MHZ)*", Dr. Gandhi and associate Chen, present figures 9, 10, and 16 that show a rapid decrease in SAR beyond 40-50 MHz with a shelving response beyond 80 MHz. These figures refute the arbitrary selection of a breakpoint in the middle of the FM Broadcast Band.

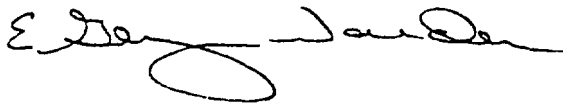
LACK OF DEFINITION OF "FREESTANDING INDIVIDUAL":

This standard leaves open for interpretation an arbitrary condition of the impedance of the human body. Measurements will vary across the work force and not be repeatable. A well written standard would define an "*adult of average of average weight and height*" as suggested in Dr. Gandhi's letter to Ericksen or a "*freestanding individual*" as referred to in IEEE C95.1. Even with proper definition a standard such as this would be difficult if not impossible to comply with under varying field conditions and a broad range of body types.

Ms. Beth Somerville
December 22, 1992
Page Two

We believe ANSI/IEEE C95.1-1992 is too vague in its language, arbitrary in its selection of its 100 MHz breakpoint and not representative of industry consensus. This standard as written will have a negative impact on the Broadcast industry and will be impossible to administer. Additionally it is impossible to see how consensus has been achieved when the concerns of the broadcasting industry have been ignored. Therefore Westinghouse respectfully requests that ANSI rescind its adoption of ANSI/IEEE C95.1 until these issues can be resolved.

Sincerely

A handwritten signature in black ink, appearing to read "E. Glynn Walden". The signature is fluid and cursive, with a large loop at the end.

E. Glynn Walden

cc: Ms. Linda A Gargiulo, IEEE
Mr. Dane Ericksen, Hammett & Edison
Mr. Michael Rau, NAB
Mr. Ken Brown, ABC
Mr. Steve Hildebrandt, Westinghouse Broadcasting Legal

Limits of Exposure to Radiofrequency Fields at Frequencies from 10 kHz – 300 GHz

Safety Code 6

Environmental Health Directorate
Health Protection Branch

Published by authority of the Minister of
National Health and Welfare

Également disponible en français sous le titre :
*Limites d'exposition à des champs de
radiofréquences de la gamme 10 kHz – 300 GHz*

EHD-TR-160

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Ottawa, Canada K1A 0S9

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ISBN 0-660-13736-4

Preface

This document is on
by the Bureau of Radiati
Welfare Canada. These
the safe use of radiation
previous Safety Code #6

The aim of this Code
installation and use of ra
in the frequency range 16
in this Code are not inter
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competent in the field
This Code will be re
particular requirement
necessary. Interpretati
obtained from the Non
of Radiation and Med

This Code was d
by Dr. D.L. Johnson,
Dr. P. Neufeld of the

Limits (RF Workers)

meter (electric field strength, magnetic field strength) defines the two exposure limits, both the electric and magnetic field, unless there is a measurement available.

Table 1

For workers exposed to electromagnetic radiation, the limits in Column 1 of Table 1 if the frequency is in Column 2 or 3 of Table 1, the value given in Column 4 shall be used for any 0.1 h period and when the radiation consists of frequency bands of Column 1 of Table 1.

The radiation (power density or electric field strength) relative to the frequency band shall be determined and the sum of the ratios shall not exceed unity.

Electric Field Strengths

Magnetic Field Strength; rms ($A m^{-1}$)	Power Density ($W m^{-2}$)
4.9	-
4.9/f	-
4.9/f	-
0.163	10
0.0093 $f^{0.5}$	f/30
0.36	50

2.1.2 Specific Absorption Rate (SAR) Limits

For portable transmitters and any other devices which produce highly spatially non-uniform fields, the values determined by the process described in Section 2.1.1 may be exceeded but the following values shall not be exceeded:

- the SAR averaged over any 0.2 of the body mass $0.4 W kg^{-1}$
- the local SAR in the eye $0.4 W kg^{-1}$
- the local SAR averaged over any 1 g of tissue, except the body surface and the limbs $8 W kg^{-1}$
- the SAR at the body surface and in the limbs (averaged over 10 g of tissue) $25 W kg^{-1}$

2.1.3 Contact – Current Limits

(a) No object with which an RF Worker may come into contact shall be energized by electromagnetic radiation in the frequency bands listed in Column 1 of Table 2 to such an extent that the current flow through an electrical circuit having the impedance of the human body exceeds the value given in Column 2 of Table 2 when the circuit is connected between the object and the ground.

Note: The permitted currents may be sensed by the worker (as a tingling or warming sensation), but will not cause any pain or damage. The permitted currents will not cause an RF burn.

Table 2.
Contact Current Limits for Occupational Exposures
(f - is the Frequency in MHz)

Frequency (MHz)	Current, rms (mA)
0.01 - 0.1	400 f
0.1 - 30.0	40

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WASHINGTON, D.C. 20036-4406

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Alan R. Rosner
David E. Helinski

MAILING ADDRESS:
P.O. BOX 65705
WASHINGTON, D.C. 20035-5705
Telephone: 202-659-3707
Telecopier: 202-659-0360

Consultants to the Firm:
Jules Cohen, P.E.
Bernard R. Segal, P.E.

September 14, 1992

Mr. Dane E. Ericksen, P.E.
Hammett & Edison, Inc.
Box 280068
San Francisco, California 94128-2304

File GEISU				
SEP 17 1992				
FILE	DATE	BY	REMARKS	INITIALS
	9/14/92	DE	DES	SS

Dear Dane:

I have your letter of August 31 to the ANSI Board of Standards Review, as well as your earlier letters that you kindly provided to me for my information. I have also Om Gandhi's letters of March 18 and July 23.

Dane, I appreciate the innovative work that Hammett & Edison has done with respect to RF measurements and analysis, and its achievement in inducing the FCC to provide better procedures in the application of the 1982 criteria; however, your present attack on ANSI adoption of IEEE C95.1-1991 is a disservice to the industry that you and I both serve. Since David Hudson left Hammett & Edison several years ago, your firm has not participated in the extensive work entailed in the revision of C95.1-1982. One letter is not a satisfactory substitute for the open discussions that have taken place in the development of the new standard.

Ralph Justus, Jim Hatfield, Ric Tell (after leaving the EPA) and I have been the only regular representatives of the broadcast industry. During work on the development of the new standard, I raised the point that the breaks within both the AM and FM bands were awkward for broadcasters' compliance and suggested formulae that would permit consistent criteria to be applied within each of those bands. Bill Guy pointed out, however, that my formulation introduced some inconsistencies in the relationship of the standards for controlled and uncontrolled environments. The result was that I was overruled and the breaks within the two broadcast bands were retained.

Mr. Dane E. Ericksen

September 14, 1992

My belief is that you are making your arguments in the wrong forum. As you are well aware, the new standard will not be applied to the broadcast and communications industries until the FCC has gone through its normal rule making procedures. When a Notice of Proposed Rule Making is issued, you should propose to the Commission that the general form and intent of the 1991 standard be adopted but minor changes be incorporated that would make them better applicable to broadcasting. For instance, I would advocate that the body current limit not be cut off at 50 MHz, but rather extended to 108 MHz. In that way, the entire FM band is treated uniformly and the important parameter of control of body current is retained.

The 1982 standard has been under attack for quite a long time. Some (unfairly to my mind) have discredited it. The 1991 standard is a substantial improvement and it should be adopted by ANSI as soon as possible so that the new standard will have the imprimatur of that respected body.

No guidelines can be perfect in all respects and comprehend every conceivable situation. Certainly, some compromises have been made in the present instance. Otherwise, no consensus could have been reached. But, by and large, this is a good standard that we can live with while protecting workers and the public. Furthermore, it is a living document subject to continuing review. Returning the standard to committee for further review and, perhaps, modification will delay replacement of ANSI C95.1-1982 by at least three years. We cannot afford to wait.

As suggested above, I urge you to use the forthcoming FCC proceeding to suggest revisions that you believe will make the standard more useful to the broadcast industry. Furthermore, I suggest that you become active in the revision process so that the committee can have the advantage of your viewpoint argued at an appropriate time, and not at the eleventh hour.

Best personal regards.

Sincerely yours,

A handwritten signature in dark ink, appearing to read 'Jules', with a stylized flourish at the end.

Jules Cohen, P.E.

cc: ANSI Board of Standards Review
Ms. Linda A. Gargiulo
Dr. Om P. Gandhi
Dr. Eleanor R. Adair
Dr. Thomas F. Budinger
Mr. Ronald C. Petersen
Dr. John M. Osepchuk



ELECTRONIC INDUSTRIES ASSOCIATION
CONSUMER ELECTRONICS GROUP

2001 Pennsylvania Avenue, NW • Washington, DC 20006-1813, USA

Phone: (202) 457-4919 • FAX: (202) 457-4985

February 3, 1993

Mr. Dane E. Ericksen
Hammett & Edison, Inc.
Box 280068
San Francisco, CA 94128-0068

VIA FAX: (415) 342-8482

Dear Mr. Ericksen,

Thank you for providing me with a copy of the IEEE SCC28 Secretariat letter of January 20, 1993, regarding the "Appeal of Board of Standards Review Action to Approve ANSI/IEEE C95.1-1991 (sic) as an American National Standard."

In reviewing Attachment 1 to that letter, I have noticed certain discrepancies in the reporting of past developments and/or discussions. These include:

1) Page 5 under 1987-1988 discussion refers to the December 1987 meeting that decided to "drop volume averaging based on complaints from broadcast community... [and] to return to induced current rules as an alternative to the objectionable volume-averaged E-field limits."

2) 1988 discussion states that "[r]epresentatives of broadcast community (Justus, Cohen, Tell) express preference for body current limit alternative."

Both these characterizations of the discussions are incorrect. The broadcast-related participants to my knowledge encourage the use of volume averaging as a legitimate means to obtain repeatable measurement results. My participation at these meetings was focused on the overall field limits under consideration, as represented in my negative ballots. I never expressed, nor do I now have, a preference for body current limits as an alternative to volume averaging. As an aside, it is curious that Mr. Tell is characterized as being from the broadcast community since he is not.

3) 1989 discussion describes a January 1989 meeting if SCIV in Las Vegas with me in attendance. To the best of my recollection I was not present at that meeting.

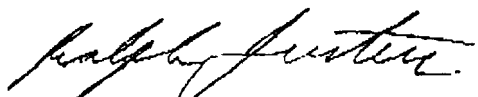
4) Page 9, discussion of July 1991 mentions that "new members on SCC28 include R. Tell, R. Justus and L. Higgins from "broadcast" community. (Justus - EIA, Higgins - ARRL.) I

Mr. Dane Ericksen
February 3, 1993
Page two,

believe it incorrect to characterize me in my capacity at EIA,
nor Higgins or Tell as representing the broadcast community

If you have any questions on these matters, please call me at
(202) 457-8716.

Sincerely,

A handwritten signature in cursive script, appearing to read "Ralph H. Justus".

Ralph H. Justus
Director of Engineering

• Exhibit 2 •

Comments: ET Docket 93-62

January 21, 1994



HAMMETT & EDISON, INC.
CONSULTING ENGINEERS
SAN FRANCISCO

HAMMETT & EDISON, INC.
CONSULTING ENGINEERS
RADIO AND TELEVISION

ROBERT L. HAMMETT, P.E.
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ROBERT P. SMITH
DANE E. ERICKSEN, P.E.
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202-396-5200
TELECOPIER: 415-342-8482

March 12, 1990

BY HAND

Mr. Denny Abrams
Abrams/Millikan and Associates
1834 Fourth Street
Berkeley, California 94710

Dear Mr. Abrams:

Attached are 20 copies of a letter addressing the issue of human exposure to radio-frequency radiation, to be used before local governmental bodies. This letter should be helpful in obtaining permission to relocate the KPFA Aural STL and the KPFB transmitter to the proposed new studios at 1929 Martin Luther King Jr. Way in Berkeley.

I have divided the letter into two parts: the first part addresses, in layman's language, general radio-frequency radiation issues; the second part discusses the proposed KPFA/KPFB facilities in particular. I suggest that copies of this letter be distributed in advance to all City Council members.

In accordance with the request of Ms. Patricia Scott, Station Manager for KPFA/KPFB, I am prepared to discuss these issues at the Berkeley City Council meeting this evening.

Sincerely,

Dane E. Ericksen

mk

Enclosures (20)

cc: Ms. Patricia Scott (1)
Mr. Steve Hawes (1)

W	W	W	W	W	W
CE	DE	FA	RE	MK	
HK	LF	EM			

HAMMETT & EDISON, INC.
CONSULTING ENGINEERS
RADIO AND TELEVISION

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March 12, 1990

To Whom It May Concern:

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by the Pacifica Foundation, licensee of Non-Commercial Educational FM Broadcast Stations KPFA and KPFB, Berkeley, California, to address radio frequency radiation issues relevant to its proposal to relocate the KPFA Aural STL and the KPFB transmitter to 1229 Martin Luther King Jr., Way in Berkeley. 1929

What is electromagnetic radiation?

The application of an electric voltage across a coil of wire creates an electric field and a magnetic field. If the applied voltage is varied in strength and in polarity between positive and negative, then the resulting "electromagnetic" field also varies in polarity and strength. The power supply to a home electrical outlet (called "alternating current") is varied at a rate of 60 times each second. This is called 60 "Hertz" in honor of scientist Heinrich Hertz (1857-1894) and is abbreviated as 60 Hz. Most home appliances will emit small electromagnetic fields at 60 Hz. They are said to be "radiating" an electromagnetic field or producing "electromagnetic radiation".

When the variations in applied voltage occur much faster, for instance at a rate of one million times each second, an electromagnetic field still results but now its frequency is one megahertz ("MHz"). Communication facilities operate at these and higher frequencies, generating electromagnetic fields in a carefully controlled range of frequencies assigned by the Federal Communications Commission ("FCC"). Audio and video receivers (radio and television sets) sense these fields and can translate the information encoded on them back into sounds and pictures.

What frequencies of radiation are normally encountered?

The FCC has allocated particular portions of the radio frequency ("RF") spectrum to specific classes of users, encompassing commercial, amateur, and private operators for fixed or mobile communication purposes, as well as noncommunication equipment such as microwave ovens. Some classes of users which typically make use of specific frequency bands are: AM "standard" broadcast stations, FM radio broadcast stations, VHF television broadcast, UHF television broadcast, various fixed stations and mobile commercial services, and amateur use, ("Ham Radio"). The FCC allocation scheme assigns the broadcast frequencies into certain well-defined bands for ease of tuning among the stations. The other services are more scattered, with numerous smaller bands of frequencies throughout the rest of the usable spectrum. Standard AM radio stations broadcast in the band from 540 to 1600 kilohertz ("kHz"). Above that band are assigned users such as public safety (police and fire

To Whom It May Concern, page 2
March 12, 1990

departments), taxicabs, cellular telephone systems, aeronautical communications and navigation systems, and military users. Television frequencies vary from a low of 54 MHz (VHF Channel 2) to about 800 MHz (TV Channel 69). Transmitting facilities have been operating on all of the above services for many years. The radio spectrum is literally crowded with millions of messages being sent and received at any instant in time.

What is "nonionizing radiation"?

RF radiation is only part of the total spectrum of electromagnetic energy. Electromagnetic radiation also includes infrared light, visible light, ultraviolet light, gamma rays, and X-rays, at progressively higher frequencies and shorter wavelengths. Of all these, only ultraviolet, gamma ray, and X-rays are high enough in frequency (short enough in wavelength) to cause ionization and be classified as "ionizing radiation".

Ionizing radiation is a term used to describe radiation which can cause a disassociation of atomic chemical bonds in living tissue exposed to it. The ultraviolet rays in sunlight are an example of ionizing radiation, causing tanning or sunburn, while light from a standard incandescent light bulb is nonionizing. All RF radiation (including microwave radiation) is nonionizing; it lacks sufficient energy to ionize living tissues. The principal effect of excessive exposure to nonionizing radiation is an increase in temperature. Energy is being received by the body, causing it to heat. Microwave ovens work by exposing food to high-power, concentrated nonionizing radiation for a sufficient period such that it heats to the point of irreversible physical change, called "cooking".

Although research in the field has been almost entirely in the area of thermal effects, some researchers have tried to identify nonthermal effects of exposure to nonionizing radiation. This is a controversial subject. It is not universally agreed that such research has been conclusive to the point where reproducible experiments have demonstrated adverse nonthermal effects.

Who sets the limits for exposure to RF radiation?

Various government agencies and industry groups have at one time or another set standards to limit human exposure to electromagnetic radiation. The Occupational Safety and Health Administration ("OSHA") has for many years used a limit of 10 mW/cm² for occupational exposure by workers to electromagnetic fields with frequencies above 10 MHz (the units here are thousandths of a watt per square centimeter, a measure of the rate at which energy flows into a small area). Researchers had identified that limit as the minimum exposure required to generate a specific rise in body temperature. A human body with prolonged exposure to power densities below such levels is widely believed to have the ability to dissipate any induced heat through perspiration and air exchange, and thus shows no cumulative effects; i.e., there is no uncontrolled temperature rise and therefore no known health hazard.

The American National Standards Institute ("ANSI") is an independent group in the private sector which sets voluntary standards for a large variety of American industry activities. In 1982 after years of research, ANSI adopted its Standard C95.1 for "Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields", covering the frequency range 300 kHz to 100,000 MHz. In developing this standard, ANSI added a safety factor of 10 to the OSHA requirement for fields in the FM and VHF television frequencies, where research had shown that the human body absorbs radiation most efficiently. A safety factor of 2 was adopted for microwave frequencies. Thus, ANSI Standard C95.1-1982,

To Whom It May Concern, page 3
March 12, 1990

which is the prevailing U.S. guideline, sets its most restrictive limit at 1 mW/cm² for exposure of unlimited duration to RF radiation. A Figure summarizing the ANSI Standard is attached.

We have heard from time to time that some international body or socialist country has (or more usually has "proposed to have") tighter standards than ANSI because of nonthermal effects but, to the best of our knowledge, no recognized national U.S. body has validated any reported foreign experiments to support lower levels.

The United States Environmental Protection Agency ("EPA"), the government entity which would issue any Federal standards, has not issued a standard for human exposure to electromagnetic fields. While the EPA is known to have been considering standards that it might impose, including limits equal to the ANSI standard as well as more stringent limits, it apparently has decided that no need for them exists. The EPA announced in 1988 that it was terminating its efforts on this subject and plans to shut down the field research offices which it previously maintained¹.

How does the FCC regulate exposure levels?

Most communication facilities are subject to the licensing requirements of the FCC. That government agency has a responsibility under the National Environmental Policy Act of 1969 to insure that any action it takes does not "significantly affect the human environment". The FCC decided this includes human exposure to electromagnetic fields. When, by 1985, the EPA had not set a Federal standard, the FCC specified the ANSI Standard as the limit with which all FCC-licensed stations must normally comply.

The FCC has acted to categorically exclude certain types of radio facilities from routine analysis of RF exposure levels. It based this exemption on the low power and/or the general inaccessibility of certain classes of stations, which insure that such facilities would have minimal impact on the human environment. Examples of categorically excluded facilities include business, police, taxicab, cellular radio stations, and point-to-point microwave links. Because of their much higher transmitter power, full service AM, FM, and TV broadcast stations are routinely considered by the FCC to assure that their facilities and operations comply with the ANSI Standard.

How much radiation now exists?

For facilities not yet built, it is possible to estimate in advance the ground level power densities which would exist once the transmitting facilities are operational. These estimates are based on conservative assumptions specified in FCC Office of Science and Technology Bulletin No. 65, "Evaluating Compliance with FCC-Specified Guidelines for Human Exposure to Radiofrequency Radiation" (October, 1985). Calculations take into account the number and relative locations of radio frequency source(s), the horizontal and vertical directivities of each transmitting antenna, and the ANSI limit corresponding to the frequency of each source. The combined radio frequency power density from all sources is sequentially calculated for each point in an appropriately-sized grid. The results can be presented graphically, if desired, to allow visualizing pertinent power density contours.

¹ August 26, 1988, letter from Mr. Lee Thomas, Administrator, EPA, to Dr. Norton Nelson, Chairman, Executive Committee, Science Advisory Board (SAB), Radiation Advisory Committee (RAC). Letter printed as part of the article "EPA Phasing Out NIER Program; No RF/MW Guidance Planned", Microwave News, Volume VIII, No. 5, Sept./Oct. 1988.

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For existing stations, it is possible to measure the intensity of electromagnetic radiation through the use of electronic test equipment specifically designed for the purpose. A very large amount of data on typical installations has been collected by our firm of consulting engineers and by others throughout the United States, including EPA field research offices. As would be expected, the strongest fields are those radiated by the transmitters with the greatest power, which typically are FM and TV broadcast stations. These stations usually radiate their energy from antennas located at the top of towers, which are often extremely tall. This energy is radiated outward in a beam similar to that of the light from a marine lighthouse. Such a beam is not accessible, except to aircraft which fly through it very rapidly. On the ground and at locations accessible to the general public, even the fields from such high-powered transmitters are generally weak. Only rarely are field strengths found which exceed the ANSI limit. These are always in close proximity to the transmitting antenna; usually where short towers are used at hilltop sites. Throughout our extensive experience in this field, we have only seldom encountered locations near permanent residences where field strengths even approach the ANSI limit. It is thus our considered professional opinion that the general public is not in any ordinary case exposed to excessive electromagnetic radiation.

How safe is safe enough?

The electromagnetic radiation limits adopted by the FCC have historical validity and are based upon the best available scientific information. It must be recognized that there are always those persons, including reputable scientists, who desire the adoption of greater safety factors than those currently in existence. The problem is analogous to the selection of an appropriate speed limit for automobiles. There is a general consensus in society that although many automobiles could attain such a speed, a speed limit of 100 miles per hour would not be generally safe. Likewise, it is apparent that some speeds above zero must be permitted for the useful employment of transportation facilities. It is known that automobile accidents generally become less severe as the official speed limit is lowered, but there is no speed limit at which society can be assured of no accidents. Indeed it must be observed that society tolerates a rather large number of accidents, even at a speed limit of 55 miles per hour. Electromagnetic radiation, in contrast, is limited by much higher standards of safety. The ANSI standard is designed to provide, with a safety factor of 10, assurance against any harm due to thermal stresses caused by electromagnetic radiation. I do not hesitate to expose myself to electromagnetic radiation which is below the ANSI limit. I consider the ANSI limit to be entirely safe, in contrast to the 55-mile speed limit which reduces accidents only to a tolerable level.

As noted, there are those persons, including some scientists, who would impose still lower limits on exposure to electromagnetic radiation. In our opinion, these persons have not yet proved a clear need for such lower limits and have not demonstrated by repeatable scientific experiments that lower limits would make a significant improvement in public health. Just as unrealistically low speed limits on automobiles represent an intolerable obstacle to the normal course of business and social activity in the U.S., so unrealistically low limits on electromagnetic radiation would impose serious barriers to continuing the present widespread use of electromagnetic radiation for commerce, public safety, and public entertainment.

Who should adopt regulations?

As noted above, the FCC has adopted national standards to limit electromagnetic radiation. The FCC has yet not preempted the more restrictive local standards which have been adopted in certain areas and which have caused no small amount of difficulty to the communication and broadcasting services which are involved in interstate commerce.

A very high level of medical and scientific competence and integrity is necessary in the development and promulgation of standards concerning electromagnetic radiation. It is our considered opinion that adequate expertise does not exist in any single local jurisdiction to justify the adoption of local standards at variance from the ANSI standard. Since the generation of electromagnetic energy is universal and the health effects, if any, are universal, it is evident that the standardized national criteria should govern.

What are the proposed KPFA/KPFB facilities?

The Proposed KPFA microwave transmitter would operate in the 950 MHz Aural STL band allocated by the FCC for studio-to-transmitter links for radio broadcast stations. At these frequencies, the ANSI Standard limits long-term exposure to 3.1 mW/cm^2 . The proposed microwave station would utilize a transmitter power of approximately 7 Watts, and a highly directive transmitting antenna located 70 feet above ground. Calculations made in accordance with FCC guidelines show the power density from the microwave station would be approximately as follows:

<u>Location</u>	<u>Aural STL station Power Density</u>	<u>Fraction of ANSI Limit</u>	<u>Percent of ANSI Limit</u>
Main beam, Golden Bear Bldg.	0.0021 mW/cm^2	1/1,500	0.067%
Studio roof	0.00033 mW/cm^2	1/10,000	0.011%
Sidewalk	0.000096 mW/cm^2	1/30,000	0.0031%

KPFB utilizes a directional antenna with a maximum effective radiated power of 570 Watts. The main beam of radiation is oriented due North. KPFB would presumably continue to operate with this same power and directional antenna at the proposed new studios, which are located only three blocks from the current KPFB site. Even if KPFB were to utilize an omnidirectional antenna with 570 Watts of power, and assuming the worst case condition of no directivity in the vertical plane, the calculated power densities would still be well below the ANSI standard, as follows:

<u>Location</u>	<u>KPFB Power Density</u>	<u>Fraction of ANSI Limit</u>	<u>Percent of ANSI Limit</u>
Studio roof	0.166 mW/cm^2	1/6	16.7%
Sidewalk	0.042 mW/cm^2	1/24	4.2%
Main beam, Golden Bear Bldg.	0.008 mW/cm^2	1/120	0.8%

Thus, the proposed facilities would comply with the ANSI C95.1-1982 Standard. While both the microwave antenna and the KPFB FM antenna in combination would still be

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well under the ANSI limit, or any likely successor standard, it can be seen that the power densities from the microwave antenna are at least two orders of magnitude less significant than those from the KPFB FM antenna.

To put the above power densities in perspective, a person would be subjected to more non-ionizing radiation (in the form of visible light and infra-red energy) sitting within 2 feet of a 100-watt light bulb than a person sitting on the roof of the KPFA/KPFB studios would be subjected to as a result of the proposed FM and microwave stations. A person would be exposed to more non-ionizing radiation sitting within 4 feet of a 100-watt light bulb than a person standing at sidewalk level next to the proposed KPFA/KPFB studios. And finally, a person would be exposed to more non-ionizing radiation sitting within 30 feet of a 100-watt light bulb than a person standing in an open window at any level of the nearby Golden Bear Building.

List of Figures

In carrying out this work, the following attached figure has been prepared under my direct supervision:

1. Summary of ANSI C95.1-1982 Standard.

mk



HAMMETT & EDISON, INC.
Consulting Engineers

A handwritten signature in black ink, appearing to read "Dane E. Ericksen", written over a horizontal line.

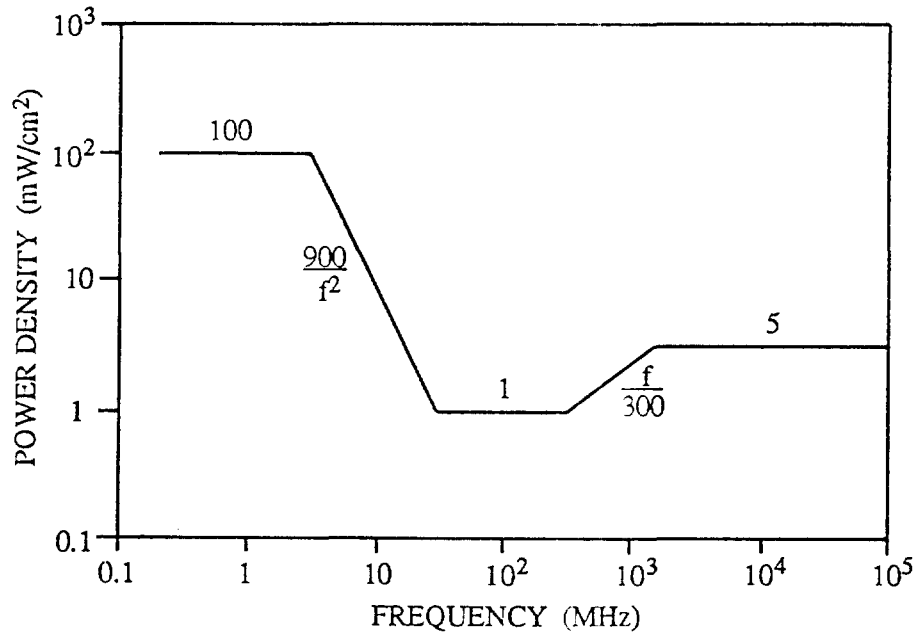
Dane E. Ericksen, P.E.

AMERICAN NATIONAL STANDARD SAFETY LEVELS WITH RESPECT TO HUMAN EXPOSURE TO RADIO FREQUENCY ELECTROMAGNETIC FIELDS, 300 KHZ TO 100 GHZ

RADIO FREQUENCY PROTECTION GUIDES

Frequency Range (MHz)	Electric Field Squared (V^2/m^2)	Magnetic Field Squared (A^2/m^2)	Equivalent Far-field Power Density (mW/cm^2)
0.3 - 3	400,000	2.5	100
3 - 30	$4,000 \times (900/f^2)$	$0.025 \times (900/f^2)$	$900/f^2$
30 - 300	4,000	0.025	1.0
300 - 1,500	$4,000 \times (f/300)$	$0.025 \times (f/300)$	$f/300$
1,500 - 100,000	20,000	0.125	5.0

Note: f = frequency (MHz).



HAMMETT & EDISON, INC.
CONSULTING ENGINEERS
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March 13, 1990

Ms. Patricia Scott
General Manager
Radio Stations KPFA & KPFB
Pacifica Foundation
2207 Shattuck Avenue
Berkeley, California 94704

Dear Ms. Scott:

Congratulations on the favorable outcome of last night's Board of Adjustments meeting. I am pleased that Hammett & Edison was able to be of service in defusing the radio frequency radiation issues.

Since it will now be necessary to prepare an application to relocate KPFB to the new studios, we would be available to prepare the technical portions of the application, if you wish. Because KPFB employs a directional antenna and because noncommercial FM stations are allocated on a contour basis rather than a simple mileage basis, the application is still somewhat involved, even though KPFB will be moving only 0.6 km. We estimate that the cost of preparing the application and all necessary showings would be approximately \$4,000. If you wish to proceed, please let me know.

Sincerely,

Dane E. Ericksen

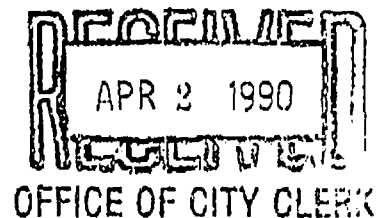
sp

cc: Mr. Steve Hawes

NLH	GFH	GES	GJS	JT
EE	SL	FS	RSJ	MK
RPS	HK	LF	EM	
FIB KPFA				

PD.

April 2, 1990
Laetitia (Tish) Pierson
1910 Berkeley Way
Berkeley California 94704



Berkeley Mayor & City Council
Berkeley California

RE: APPEAL OF 1929 M.L.K. WAY USE PERMITS, VARIANCES, AND
NEGATIVE DECLARATION FOR KPFA/KPFB-FM RADIO DEVELOPMENT PROJECT

Dear Mayor and Councilmembers,

I hereby appeal the March 12, 1990 decision of the Board of Adjustments granting use permit A1662 and Variance No. 1304 to the Pacifica Foundation for the development of a KPFA-FM construction project at 1929 MLK Way.

I am also appealing the Negative Declaration granted for this project under the California Environmental Quality Act. This project requires an environmental impact report (EIR).

Variations and use permits are only allowed when the granting of the variations and use permits would be non-detrimental. The variations granted to Pacifica/KPFA would most certainly be detrimental to the surrounding neighborhood. Additionally, the applicant neglected to apply for certain variations that their development plans indicate would be needed for their project:

1) Section 9.6(a) of the Zoning Ordinance requires a 5 feet setback. The applicant has not applied for the variance required for their 4 feet setback.

2) Their plans violate Section 9.8(c)(2) of the Zoning Ordinance requiring that parking spaces must be oriented to minimize use of residential streets.

3) Section 9.7(e) allows a maximum of 45 decibels. The noise levels of the broadcast tower has not been addressed. Sutro tower in San Francisco has been found on windy days to generate more noise than a jack hammer, through the Aeolian Harp effect.

4) Section 9.7(b) has been violated since KPFA has refused to specify what their lighting plans are.

5) Section 9.7 (a) is being violated by the applicant's patio and windows. The purpose of this section of the Zoning Ordinance is to minimize privacy intrusion on to residential properties.

6) The applicant's plans include the removal of a mature